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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/784,088 02/16/01 MOON

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EXAMINER

MM91/0608

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ART. 113.0 PAPER NUMBER

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06/08/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**Office Action Summary**

Application No.

09/784,088

Applicant(s)

MOON ET AL.

Examiner

Quoc Hoang

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-16 are rejected under 35 U.S.C 103(a) as being unpatentable over Applicant's admitted prior art in view of Kim et al. (US Patent 6,204,081).

Regarding claims 1, 6, 9, 12, and 15: Applicant's admitted prior art on pages 2-5 and Figs 1-2 which disclose a method of forming an array substrate for use in a liquid crystal display (LCD) device comprising the steps of forming a first metal layer on a substrate 9; forming a gate line 13, a gate electrode 10 and a gate pad 11 by patterning the first metal layer; forming sequentially a first insulation layer 26, a semiconductor layer 27 and a second metal layer 24 over the patterned first metal layer and on the substrate 9; forming a source electrode 17, a data line 19, a drain electrode 18 and a data pad 15 by patterning the second metal layer 24; forming a

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second insulation layer 31 on the patterned second metal layer and on the semiconductor layer; forming a photoresist 33 on the second insulation layer 31.

Applicant's admitted prior art does not teach performing an exposure process on the photoresist using a mask; removing completely a first portion of the photoresist over the gate pad after performing the exposure process; removing incompletely a second portion of the photoresist over the data pad after performing the exposure process, wherein a residual photoresist remains over the data pad; etching the second insulation and semiconductor layers over the gate pad while etching the residual photoresist over the data pad; and etching simultaneously the first insulation layer over the gate pad and the second insulation layer over the data pad.

Kim et al., shows a method of forming a substrate of a liquid crystal display (LCD) device comprising the steps of performing an exposure process on the photoresist 155 using an exposing mask 100 (col. 5, lines 22-65, and Fig. 5a) ; removing completely a first portion 130d of the photoresist 155 over the gate pad 160b after performing the exposure process (col. 6, lines 10-23, and Fig. 5b); removing incompletely a second portion 130c of the photoresist 155 over the data pad 170c after performing the exposure process, wherein a residual photoresist 155a remains over the data pad 170c (col. 6, lines 23-45, and Fig. 5b); etching the insulation 170 and over the gate pad 160b while etching the residual photoresist 155a over the data pad 170c (col. 6, lines 33-45, and Fig. 5c).

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Applicant's admitted prior art and Kim et al., are combinable because they are from the same field of endeavor. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to perform an exposure process on the photoresist using an exposing mask. The motivation for doing so is to form a residual photoresist over the pad gate and the data gate so that the residual photoresist can be used as an etching stopper to protect the data pad from overetching. Therefore, it would have been obvious to combine Applicant's admitted prior art with Kim et al., to obtain the invention of claims 1, 6, 9, 12, and 15.

Regarding claims 2-3, and 7-8: Kim et al., disclose the exposing mask 100 that is used in irradiating the photoresist 155 includes a half-tone pattern (co. 5, lines 47-65, and Fig.5a-5b).

Regarding claims 4-5: Kim et al., disclose the residual photoresist 155a is formed over the data pad 170c, but do not disclose the residual photoresist 155a has a thickness of less than 5000 A. However, the modification to have the residual photoresist 155a which has a thickness of less than 5000 A would be an obvious to one ordinary skill in the art. The modification does not provide any unexpected, or nonobvious result, and would have been one of numerous parameters chosen by the ordinary skilled artisan during routine experimentation.


Regarding claims 10-11, and 13-14 : Kim et al., disclose a residual photoresist 155a remains after irradiating the photoresist 155 and the exposing mask 100 (col. 5, lines 47-65, and Fig.5a-5b).

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Regarding claim 16: Kim et al., disclose removing the second portion of photoresist 155 after the etching step (col. 6, lines 32-45, and Fig. 5c).

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (703) 306-5795. The examiner can normally be reached on Monday -Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms., can be reached on (703) 308-4910

  
Quoc Hoang  
Examiner  
Group 2818

  
David Nelms  
Supervisory Patent Examiner  
Technology Center 2800